

How to play space war on the Rolm 1601 (rugged Nova*)

Two warring rocketships encounter one another in outer space. Their mission: to destroy one another. The rocketships are in the vicinity of a large star. They maneuver and fire missiles at one another. The gravitational attraction of these objects in space must be considered by the opposing rocketship commanders. They must constantly know the amount of fuel being used, the mass of their rocketships as they use fuel, and the trajectory of the missiles.

The 1601 Spacewar program simulates this environment.

The 1601 system executing the Spacewar program consists of just 4096 sixteen-bit words of core memory. The compact system also has a real-time clock, Teletype interface, XY point plotting display control, and a Spacewar console interface. The output of the point plotting display is shown on a large CRT display.

The large star appears in the center of the XY-CRT display screen. Two contestants each have a spaceship control console with controls to do the following:

1. ready the rocketship for action;
2. accelerate his rocketship with two levels of thrust;
3. rotate his ship clockwise or counterclockwise; and,
4. fire missiles.

There are three sets of indicators on the control consoles:

1. one indicates current mass of the rocketship;
2. the second indicates the number of missiles available; and,
3. the third, amount of fuel remaining.

The displays are updated in real-time by the 1601 program.

The object of the Spacewar game is to shoot down the opposing rocketship by firing missiles so that they intercept the opposing rocketship. Missiles are fired at a constant velocity relative to the ship that is firing the missile.

Missiles stay in flight for twenty seconds and then disappear. The screen wraps around on both axes so that ships and missiles exiting the screen on the right, for example, will reappear on the left.

Rocketships and missiles colliding with the star explode.

Elapsed time appears in the top left-hand corner of the screen indicating number of seconds the game has been in progress. A game lasts three minutes or until a rocket is destroyed. When a rocketship explodes or time is elapsed, the game ends.

The Spacewar program demonstrates many of the features of the 1601. It is a sophisticated program which demonstrates all of the input/output

features of the 1601 in real-time. The program uses the 1601's data channel and program interrupt inter-leaved with complex calculations.

The Rolm 1601 is the first rugged general purpose computer to be built around medium-scale integration, and features a multi-accumulator/index register central processor organization, a choice of core or read-only memory and direct memory access and automatic priority interrupt as standard features.

The basic 1601 package can contain up to 16K of memory and interfaces to a large number of peripheral devices. This package is a standard ATR box. The basic box is 7.6" x 10.1" x 12.5" which includes power supply and space for 14 circuit modules. The CPU requires 5 circuit modules. The extended arithmetic option requires 2 modules. Two of the modules may be MOS Read Only Memory with up to 2048 words per module. MOS Read Only Memory is available in increments of 256 words. Core Memory is available in modules of 4096 words. A core memory module is 7.6" x 10.1" x 3.2" and literally plugs into the basic box. The basic machine can address up to 32K 16-bit words of memory and/or interfaces for up to 62 peripheral devices.

A 4096 sixteen-bit word 1601 with Teletype interface, data channel, priority interrupt and power failure protect and auto restart costs less than \$20,000.

* We're licensed by Data General Corp. to manufacture a severe environment version of the Nova.

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